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A three-phase study was devised to investigate possible differences in the teaching effectiveness of trained and untrained upper-grade elementary school student tutors. In phase one, objectives for instruction in linear mathematical equations were specified for first-grade students and special instructional materials were prepared. Tutorial skills were identified with these specific objectives and materials (using an evaluation-revision strategy) and were formulated into tutoring techniques in phase two. Phase three of the study was concerned with a number of tests of the validity of the identified tutoring techniques. In one test, 16 first graders who had scored low on a pretest were randomly assigned to one of two treatment groups, the tutors of one group having been trained and the tutors of the other having received no training. Both groups used the same instructional materials and were allotted the same amount of time. Results from a posttest indicated that the effectiveness of trained student tutors was greater than that of untrained tutors. These findings were similar in two further tests. It is hoped that further tutor training will be approached empirically and that appropriate, generalizable tutorial skills will be identified and validated. (A five-item bibliography is included.) (SM)

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THE EFFECTS OF TRAINED AND UNTRAINED STUDENT TUTORS ON THE CRITERION PERFORMANCE OF DISADVANTAGED FIRST GRADERS[1]

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Recent research dealing with intergrade tutoring suggests that the effectiveness of a student tutor in bringing the learner to specified criterion is primarily dependent on whether or not the tutor is trained to comply with established principles of learning and other behavioral skills relevant to the stated objectives in the tutorial relationship. (Harrison, 1968). Studies have shown that when children are left to their own devices, the older ones tend to boss younger children and exclude them from rewarding patterns of interaction (Lippitt, 1968). Lippitt reports that simply providing opportunities for children of different ages to interact is not a sufficient condition for the development of growth-supportive patterns of cross-age-interactions. The studies conducted by Lippitt have shown that tutors need to be trained in the following areas: (1) How to approach younger children constructively; (2) Ways of getting the younger child to accept instruction; (3) Techniques for dealing with errors; and (4) How to praise the younger child. These findings correspond significantly with Harrison's findings (1968). The following twelve tutorial skills were found to be vital to the tutorial relationship: (1) Require learner to maintain attention to the task; (2) Require learner to make active responses; (3) Require learner to exhibit the type of response called for; (4) Orient learner to the task; (5) Establish and maintain rapport with the learner; (6) Avoid punishing behavior; (7) Provide feedback; (8) Criterion for acceptable responses; (9) Provide remedial tutoring; (10) Skip redundant instruction; (11) Provide positive reinforcement; (12) Repeat prior instruction when necessary.

These and other studies (Frager and Stern, 1968; Ellson, 1968) have resulted in more focus on tutor training. However, the limited work done in this area has not produced sufficient hard data to completely substantiate the assumed advantages of controlling the behavior of student tutors by means of specific training in interacting with the learner.

The research being reported was designed to measure for possible differences in the effectiveness of trained and untrained student tutors in bringing learners to specified criterion. The research was carried out in three phases: 1) Specification of objectives and selection of instructional materials; 2) Identification of tutorial skills and formulation of tutoring techniques; and 3) Validation of tutorial procedures.

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In an effort to identify appropriate objectives the researcher contacted the curriculum specialist in the school district[2] where the research was conducted. After considerable deliberation it was determined that one of the most basic problems of disadvantaged first graders was in mathematics. The curriculum specialist indicated that disadvantaged first graders consistently had a great deal of difficulty with math equations in linear form. It was decided that the objectives would be those associated with some form of linear math equation. The researcher was informed that the Greater Cleveland Mathematics Program was being used in the school district, so it was agreed to investigate the feasibility of the tutors using these materials.

An evaluation-revision strategy was used to identify tutorial skills relevant to effective tutoring with the objectives and materials. Upper-grade elementary students were selected to tutor first grade children. They were trained by the experimenter in various approaches to tutoring (e.g., Ellson Model, Frager Model, Harrison Model). To identify tutoring skills and techniques that seemed most effective, the experimenter observed each tutor while he worked with at least two learners. Some of the skills identified resulted directly from the tutoring models that were evaluated; others are completely unique to the objectives and materials.

After a basic set of tutoring skills were identified, a tutoring technique was formulated that incorporated these skills. Using the newly formulated tutoring technique the experimenter trained two student tutors and observed them working with several children. Training for the next group of tutors was modified as a result of the evaluation of the previous group of tutors; this group of tutors were observed while tutoring and further revisions in the procedures were made based on these observations. Additional evaluations and revisions of the tutorial procedures were carried out until it appeared fairly evident that the learners were consistently profiting from the individualized tutoring.

By means of a diagnostic test, sixteen first-graders were identified who were completely naive of stated objectives (scored zero on test). These children were randomly assigned to two treatment groups. One group to be tutored by upper-grade elementary students who were trained by the experimenter, and the other group to be tutored by upper-grade elementary students who received no training.

Student tutors who received training were given training in the use of the following tutorial skills: (1) Take steps to put the child at ease; (2) Explain required task; (3) Teach the child to check his answer; (4) Require the child to read each problem aloud; (5) Require the child to make a written response before giving feedback; (6)

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[2] Santa Monica Unified School District.

Require the child to check his answer before providing confirmation; (7) Provide the child with verbal praise; (8) Reward the child after each correct response; (9) Avoid punishing behavior; and (10) Check for mastery.

The untrained tutors were introduced to the instructional materials and told they had been selected to tutor first-grade children who needed help with their math. They were told their job was to teach the child how to do the problems.

It was found that the Greater Cleveland Mathematics materials were not entirely adequate, consequently special instructional materials were prepared. These materials consisted of practice items (sentence equations) sequenced according to difficulty. Both groups of tutors used these instructional materials.

The time required for the trained tutors to bring the younger children to specified criteria was recorded. The time required ranged from one to four tutoring sessions (15-20 minutes). As far as it was possible, the time the untrained tutors spent tutoring the younger children was kept constant with the time that had been recorded for the trained tutors.

The experimenter observed all tutors while they were working with the younger children. It was noted that the trained tutors were very consistent in following the specified tutorial procedures. In contrast, the untrained tutors consistently did things that would appear to interfere with learning (e.g., punishing behavior, extensive over-cueing, no verbal praise, no friendly, non-instructional conversation, feedback before written response, no effort to clarify prescribed task).

A parallel form of the test used in selecting the first-graders was used to measure learning gains following the individualized tutoring. The mean scores for the two groups were:

TREATMENT GROUP	n	Five-Item Posttest	
		Mean	S.D.
Tutored by untrained tutors	8	4.6	8.43
Tutored by trained tutors	8	20.0	0

Another group of first graders was identified by means of a diagnostic test. This group was in need of individualized help with a particular type of sentence equation (e.g., 3 + □ = 5). Once again these children were randomly assigned to two treatment groups. One group to be tutored by upper-grade elementary students who were trained by the experimenter, and the other group to be tutored by upper-grade elementary students who received no training. Each tutor

was allowed to work with the younger child one-half-hour per day for four days using instructional materials prepared by the experimenter.

The following are the mean scores on both the pre- and posttest of the two treatment groups.

TREATMENT GROUP	n	Six-Item Pretest		Six-Item Posttest	
		Mean	S.D.	Mean	S.D.
Tutored by untrained tutors	6	1.5	1.510	1.5	1.97
Tutored by trained tutors	9	0.5	0.726	4.4	2.35

In the next phase of the study four student tutors who were randomly selected were trained by members of the school staff using training materials developed by the experimenter. Four other student tutors were randomly selected who did not receive any training. The eight tutors were then randomly assigned to work with first graders who needed individualized help with a specified objective. Each tutor was allowed to work with the younger child one-half-hour per day for four days using instructional materials prepared by the experimenter.

The following are the mean scores on both the pre- and posttest of the two treatment groups.

TREATMENT GROUP	n	Ten-Item Pretest		Ten-Item Posttest	
		Mean	S.D.	Mean	S.D.
Tutored by untrained tutors	4	0	0	0	0
Tutored by trained tutors	4	0	0	6.2	4.5

These findings would seem to support the assertion that the effectiveness of student tutors can be significantly improved by means of proper training. However, it should be noted that these tutorial procedures were developed for a specific tutorial setting using particular instructional materials. Consequently, the degree to which these results are appropriate or generalizable to other tutorial settings is limited.

It does appear, however, that some of the basic tutorial procedures, such as having the tutor provide positive reinforcement and avoid punishing behavior, would be applicable to most tutorial relationships.

Hopefully, in the future the training of tutors will be approached empirically, and appropriate tutorial skills will become more generalizable. There is a need for this study to be replicated with other materials and objectives. It needs to be determined whether it is consistently possible to identify and validate tutorial skills that do produce significant learning.

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